

Patent claims

1. Collector/dryer unit for heat exchangers, and in particular for a refrigerant condenser of a motor vehicle air-conditioning system, having a collector and a dryer accommodated in exchangeable fashion therein, the collector having a jacket wall that extends around its longitudinal axis and that is formed, at least in a segment extending along the longitudinal axis, by a first tube, the collector having at least one inlet opening for a fluid, such as refrigerant, as well as at least one outlet opening for the fluid, and the outlet opening being situated in the end area facing the first axial end of the collector, and the collector having at its second axial end, facing away from the first axial end, a removal opening for exchanging the dryer, and a detachable closure being provided for this removal opening in the area of the second end,

characterized in that

on the side of the first tube facing away from the first end, an adapter device or a first profile piece for the detachable closure is provided on which the detachable closure is held in its closed position.

2. Unit as recited in Claim 1, **characterized in that** the adapter device or the first profile piece is inserted with an end area into an end of the first tube, or is fitted onto an end of the first tube.

3. Unit as recited in one of the preceding claims, **characterized in that** the adapter device or the first profile piece is connected immediately to the first tube, in particular by means of a soldered connection or a welded connection.

4. Unit as recited in one of the preceding claims, **characterized in that** the adapter device or the first profile piece forms a segment of the jacket wall of the collector,

extending around the longitudinal axis of this collector, in particular the end segment situated at the second end of this jacket wall.

5. Unit as recited in one of the preceding claims, **characterized in that** the first profile piece, or the adapter device, has a tube-shaped or annular construction.

6. Unit as recited in one of the preceding claims, **characterized in that** the first profile piece is an extruded component.

7. Unit as recited in one of the preceding claims, **characterized in that** the first tube has an essentially constant wall thickness.

8. Unit as recited in one of the preceding claims, **characterized in that** the adapter device, or the first profile piece, is a component that is different from the first tube.

9. Unit as recited in one of the preceding claims, **characterized in that** the inner surface of the first profile piece has, in segments or completely, a circular construction, in the cross-section seen perpendicular to the longitudinal axis thereof.

10. Unit as recited in one of the preceding claims, **characterized in that** the inner surface of the first profile piece, seen in cross-section perpendicular to the longitudinal axis thereof, has different (inner) circumferential dimensions along this longitudinal axis.

11. Unit according to one of the preceding claims, **characterized in that** the first profile piece has at least one groove for receiving a securing ring.

12. Unit according to Claim 11, **characterized in that** a securing ring is detachably situated in this groove, and by means of this securing ring the closure element is blocked in the direction facing away from the first end of the unit.

13. Unit according to one of the preceding claims, **characterized in that** the closure element is constructed as a screw closure, and is screwed into a threading of the adapter device or of the first profile piece in order to provide a detachable closure of the collector.

14. Unit as recited in one of the preceding claims, **characterized in that** at least one sealing device is provided, in particular at least one sealing device for sealing the detachably held closure against the first profile piece or adapter device, or against the first tube.

15. Unit as recited in one of the preceding claims, **characterized in that** the closure and/or the first profile piece, or the adapter device, has at least one groove for receiving an O-ring.

16. Unit as recited in one of the preceding claims, **characterized in that** at least one O-ring is held in a groove or grooves of the closure, and this O-ring works together with a surface segment of the first profile piece or of the adapter device and/or of the first tube to achieve a sealing effect, in particular with a segment of an inner surface.

17. Unit as recited in one of the preceding claims, **characterized in that** seen in the direction of the longitudinal axis of the collector, the first profile piece is short, in particular in comparison with the first tube.

18. Unit as recited in one of the preceding claims, **characterized in that** the first profile piece has a round construction.

19. Unit as recited in one of the preceding claims, **characterized in that** the wall thickness of the first profile piece is greater than the wall thickness of the first tube.

20. Unit as recited in one of the preceding claims, **characterized in that** the first profile piece is provided with a threading for receiving a closure provided with a threading, and/or with a groove for receiving a securing ring, and the remaining wall thickness in the area in which the wall thickness is reduced by the threading recesses and/or the
5 groove is greater than or equal to the wall thickness of the first tube.

21. Unit as recited in one of the preceding claims, **characterized in that** the inlet opening for the fluid is situated in the end area facing the first axial end of the collector.

22. Unit as recited in one of the preceding claims, **characterized in that** the inlet opening and/or the outlet opening of the collector are fashioned as rim holes, in particular protruding outwards, forming in particular at least a segment of an overflow passage.

23. Unit as recited in one of the preceding claims, **characterized in that** the inlet opening and/or the outlet opening of the collector are formed by outwardly oriented projections having a preferably annular outer contact surface.

24. Unit as recited in one of Claims 22 and 23, **characterized in that** the stamped-out parts or rim holes are provided on the first tube.

25. Unit as recited in one of the preceding claims, **characterized in that** in the end area of the collector facing the first end of the collector, a second, preferably extruded, profile piece is provided.

26. Unit as recited in Claim 25, **characterized in that** the second profile piece has the inlet opening and/or the outlet opening of the collector, each of these openings being fashioned in particular as a bore provided in a jacket wall.

27. Unit as recited in one of Claims 25 and 26, **characterized in that** the second profile piece is connected to the first tube, in particular immediately, for example via a soldered connection.

28. Unit as recited in one of Claims 25 to 27, **characterized in that** the second profile piece is closed in the area of its end facing away from the second end of the collector, in particular by means of a detachable closure.

29. Unit as recited in one of the preceding claims, **characterized in that** the collector houses a filter device for the fluid, which filter device preferably forms a unit with a dryer cartridge.

30. Heat exchanger, in particular air-conditioning condenser for a motor vehicle air-conditioning system, having a collector/dryer unit as recited in one of the preceding claims.

31. Heat exchanger as recited in Claim 30, **characterized in that** the heat exchanger has a tube block or tube/fin block having a multiplicity of tubes that are essentially parallel at least in sections, and possibly having fins situated between the tubes, the first ends being received by a first collector tube, and the collector being situated parallel to this first collector tube, and the first collector tube having at least two openings of which one is allocated to the inlet opening of the collector and one is allocated to the outlet opening of the collector, so that an overflow opening or overflow passages are formed in order to enable a flow of fluid or refrigerant from the first collector tube into the collector and vice versa.

32. Heat exchanger as recited in Claim 31, **characterized in that** a second collector tube is provided that receives the second ends of the tubes of the tube block or tube/fin block.

33. Heat exchanger as recited in one of Claims 30 to 32, **characterized in that** the first collector tube has a shell-shaped cover part as well as a shell-shaped base part connected thereto, in particular by soldering or welding, this cover part and this base part interacting to form a jacket wall of the first collector tube, and openings, in particular slots, being
5 provided in the base part in order to receive the first ends of the tubes of the tube block or tube/fin block.

34. Heat exchanger as recited in one of Claims 30 to 33, **characterized in that** the first collector tube has rim holes protruding inward or outward in order to form the openings that are allocated to the inlet opening or to the outlet opening of the collector.

35. Heat exchanger as recited in one of Claims 30 to 34, **characterized in that** the rim holes of the first collector tube engage in telescoping fashion in the rim holes of the collector, so as to form overflow openings or overflow passages.

36. Heat exchanger as recited in one of Claims 30 to 35, **characterized in that** the rim holes of the first collector tube and the rim holes of the collector are situated so as to abut one another bluntly with respectively outwardly-directed end surfaces, so as to form overflow openings or overflow passages, the respective abutting rim holes preferably
5 having essentially identically shaped and identically dimensioned end surfaces.

37. Heat exchanger as recited in Claim 36, **characterized in that** the rim holes that abut one another with their end surfaces are radially outwardly sheathed by a common sleeve, or radially inwardly accommodate a common sleeve, in particular making contact therewith.

38. Heat exchanger as recited in one of Claims 30 to 37, **characterized in that** the first collector tube, in order to form the openings that are allocated to the inlet opening or to

the outlet opening of the collector, has outwardly directed projections having a preferably annular outer contact surface.

39. Heat exchanger as recited in one of Claims 30 to 38, **characterized in that** the first collector tube has outwardly protruding collars each of which forms an opening, which engage in the inlet opening or in the outlet opening of the collector in order to form overflow openings or overflow passages, the inlet opening and/or the outlet opening of
5 the collector preferably being situated on the second profile piece.

40. Heat exchanger as recited in one of Claims 30 to 39, **characterized in that** the second profile piece has an outer surface area that faces the first collector tube and whose shape is adapted to an outer surface area of the first collector tube, in particular having a curved construction, and these outer surface areas contacting one another.

41. Heat exchanger as recited in one of Claims 30 to 40, **characterized in that** the collector and the first collector tube are held spaced apart from one another by a slot.

42. Heat exchanger as recited in one of Claims 30 to 41, **characterized in that** a holding element, fashioned in particular as a ring holder, is provided that holds the collector on the first collector tube in the area of the second end of the collector, and, if necessary, forms a terminating cover of the first collector tube.

43. Heat exchanger as recited in Claim 42, **characterized in that** the ring holder surrounds the collector with an annular section or a section having the shape of a segment of a ring.